PadhAI: 6 Jars of Sigmoid Neuron

One Fourth Labs

Limitations of Perceptron

1. Perceptron model: $y = \sum_{i=1}^{n} w_i x_i >= b$
2. Consider the following dataset

Salary in thousands	Can buy a car?
20	0
30	0
50	1
60	1
70	1

3. Plotting the perceptron results

4.
5. The function looks like a step, it has a value(50) beyond which the curve suddenly changes orientation
6. So it divides the input space into two halves with negative on one side and positive on one side
7. This case reproduces in higher dimensions, 2D, 3D etc.
8. It cannot be applied to non-linearly separable data.

9. The function is harsh at the boundary. For eg: 49.9 would be 0 and 50.1 would be 1. In practical real-life scenarios, a much smoother boundary is more applicable.
10. What is the road ahead?
    a. Data: Real inputs 😃
    b. Task: Regression/Classification, Real output 😃
    c. Model: Smooth at boundaries, Non-linear(😃 and ☹ because it's not a very advanced non-linear model)
    d. Loss: $\Sigma_i(y_i - \hat{y}_i)^2$ 😃
    e. Learning: A more generic Learning Algorithm 😃
    f. Evaluation: Accuracy, Root-mean-squared-error